

## ABSTRACT

A control device (30) receives a power supply current (Ib) from a current sensor (11) and a reactor current (IL) from a current sensor (18) and detects a maximum value (IL<sub>max</sub>) and a minimum value (IL<sub>min</sub>) from the reactor current (IL) and from the detected maximum and minimum values (IL<sub>max</sub> and IL<sub>min</sub>) and the power supply current (Ib) determines whether the reactor current (IL) traverses the zero point, and if so the control device (30) generates and outputs a signal (PWMS) to an up converter (12) which responds to the signal (PWMS) by stopping switching to perform an up or down converting operation.